

Lactation in kid and calf–Case reports

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Abstract

In the present paper two abnormal cases of prematurely developing mammary gland are reported. A kind started lactation from the age of twelve days and now it is giving 250-300 ml. of milk daily after attaining an age of four months. In another case, a two months old calf is found to have an abnormally developed enlarged udder which can also produce milk. The cases are studied and reviewed with the intention to find out the possible reasons lying behind these abnormal developments. Hormonal disbalance may play a major role in addition to the suspected effect of organochlorine toxicity.

Introduction

Development of udder and secretion of milk is a physiological phenomenon of mammals, which is related with puberty, pregnancy and birth of offspring. Several hormones work together in the way of milk production. But two atypical cases were observed. In one case, kid is letting down milk till date starting from the age of twelve days and in the another, one two month old calf is secreting milk after stimulation.

Description

Case 1. Black Bengal is the predominant breed of goat found in West Bengal. Parula Bibi, owner



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of a Black Bengal red goat reported that the black coloured twelve days old kid of goat was noticed to have an enlarged udder and teat. When the teat was pressed with curiosity, a little amount of milk comes out from it. Afterwards, regular milking of the kid is in practice. Now, at the age of about four months, the kid is giving 250-300 milliliter of milk daily.

Apparently growth of the kid is faster in comparison with other kids of goats. Kid was able to eat and digest a good amount of forage from one month of her age. Interestingly, the kid still sucks milk of her mother occasionally.

Case 2. A two months old female calf is brought by Md. Alimuddin seikh, with an enlarged udder. The well developed udder was soft and smooth as seen in pregnant heifers and a little amount of milk secretes from it during pressing of the teats. The calf was weak and malnourished.

Discussion

In the mammals, there is no histologic or functional difference in the breast of male and female prior to onset of puberty. The pubertal growth of the female mammary tissue is dependant primarily on the action of estradiol, which includes growth, division and elongation of the tubular duct system and other related works (Harrison *et.al*, 1998).

In the newborn, sometimes slight mammary and teat development is noted along with a slight amount of serous secretion, probably due to the placental transmission of some of the circulating maternal steroid hormones. In rare cases, it may be marked in dairy calves (Roberts *et.al*, 1982). There have been a few instances of dairy heifers 5 to 12 months of age or older that developed marked mammary development with a little secretion. The cause is usually not known, but granulosa cell tumors of the ovary may rarely be the cause (Roberts *et.al*, 1982).

During first half of gestation in the heifer and cow, cellular proliferation of the mammary ducts and alveoli occurs under the influence of steroid hormones, progesterone and estrogen, from the ovaries and the placenta. (Roberts *et.al*, 1982).

In goats, estrogen alone can induce complete udder growth and lactation, but some other endothelial secretions might play a role (Roberts *et.al*, 1982). In cows, the growth of the secondary tissue is completed by the fifth month of pregnancy (Roberts *et.al*, 1982). Once the anatomic development of the ducts and alveoli is complete, the continued action of estrogen and progesterone is not required for lactation itself (Harrison *et.al*, 1998).

The onset of lactation at the time of parturition coincides with the drop in progesterone and especially estrogen levels in the blood that have provided for mammary growth, and with a marked rise in the level of prolactin from the pituitary gland necessary for the initiation and maintainance of lactation. Oxytocin released by suckling might be closely associated or cause of release of Prolactin and growth hormone (STH) from anterior pituitary gland (Roberts *et.al*, 1982).

In most of the animals, the ejection or let down of milk is also associated with stimuli, such as sucking, milking or massage of the udder and teats which act on hypothalamus and cause secretion of oxytocin and vasopressin from posterior pituitary. But the release of oxytocin does not occur at milking time in goats and is not essential for complete milking of the goat udder (Folley *et.al*, 1966).

There were no obvious changes seen in the growth hormone and prolactin level during whole gestation period of goat (50-60 ng/ml), but secretion of both the hormone increases acutely after parturition and remains at a high level for sometime (250-300 ng/ml upto 3 weeks) (Hashizume *et.al*, 1999). The prolactin level of nursing mother decreases gradually, reaches at the level of 20 ng/ml at 9th week after parturition. The rise in prolactin level of goat after parturition may be due to the reason that sucking by kids can stimulate prolactin release from pituitary of the she goats. The sucking episode by the kids decreases with time after birth, and generally 3 months old kids can consume forage (Hashizume *et.al*, 1999).

Conclusion

In the case no. 2, two month old calf shows an

well developed udder with teats and letting down traces of milk on stimulation. This is at per with the previous observations where such instances were found in the calves having age 5 - 12 months or more (Roberts *et.al*, 1982).

In the case no. 1, the kid was born in the middle of April, 2007, her lactation starts from the age of 12 days and is still continued after attaining 4 month of age. High level of prolactin in the blood may be the reason of it, but plasma concentration of growth hormone and prolactin of kid remain high one week after birth (prolactin- 100-125 ng/ml) and decrease thereafter (20 ng/ml at 6th week and 10ng/ml after 8 weeks of age) (Hashizume *et.al*, 1999). Some part of the high level of prolactin and growth hormone in the blood of suckling neonates might be derived from mother's milk, but it should also be diminished with age advancement. It is postulated that high concentration of plasma growth hormone in neonate kid (upto 4-5 weeks) might be associated with rapid growth in kids and the high concentration of plasma prolactin (also upto 4-5 weeks) might control the tuberoinfundibular dopaminergic neuronal activity in neonates (Hashizume *et.al*). In the present case, lactation of the kid for months means presence of prolactin and growth hormone in the blood at a high level during that period, which may also be the reason of such rapid growth of the kid. There may be a relation between manual stimulation of teat and secretion of prolactin hormone in that kid, as happens in lactating goat.

Industrial chemicals including Organochlorine pesticides act as weak estrogens, which can promote growth of the follicles, leading to the pronounced development of secondary sex traits, increase in sex urge in women and can stimulate breast cell division by changing chemical structure of estradiol hormone of the body (Ghai, *et.al*,

1999). This can not be overlooked in animals, as they are far more prone to ingestion of pesticides than human.

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References

- Folley, S.I. and Knaggs, G.S. (1966). Milk ejection activity (Oxytocin) in the external jugular vein blood of cow, goat and sow in relation to the stimulus of milking or suckling. *Journal of Endocrinology*; **34**:197.
- Ghai, O.P. and P. Gupta (1999). Essential Preventive Medicine - A Clinical and Applied Orientation. Vikas Publishing House Pvt. Ltd. New Delhi. pp 75-77.
- Harrison, T. R., Anthony S. Fauci and others (1998), *Harrison's Principles of Internal Medicine* (14th ed.) Mc. Graw-Hill Health Professions Division. pp 1972-1990, 2116-2118.
- Hashizume, T; Takahaski, Y.; Numata, M.; Sasaki, K.; Ueno, K. Ohtsuki, K.; Kawai, M; and Ishii, A. (1999). Plasma Profiles of Growth Hormone, Prolactin and Insulin like Growth factor-1 during Gestation, Lactation and the Neonatal period in Goats. *J. Repro. and Dev.* **45**: 273-281.
- Roberts, S. J. (1982). *Veterinary Obstetrics and Genital Diseases* (2nd ed.). CBS Publishers and distributors, New Delhi. pp 99-102.